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by Agus Pahrudin

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Development of Islamic Value-based Picture in Biology Learning with the ISI-ARE Model

Agus Pahrudin[1]*, Syafrimen Syafril[1], Ro'inatuz Zahro[1], Akbar Handoko[1], Nova Erlina Yaumas[1], Zanaton H Iksan[2]
[1]Faculty of Education and Teacher Training, Universitas Islam Negeri Raden Intan Lampung, Indonesia
[2]Faculty of Education, Universiti Kebangsaan Malaysia, Malaysia

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***Correspondence Address:**
agus.pahrudin@radenintan.ac.id

Abstract: The development of Islamic-based learning models and pictures media recently has become the focus of research in Indonesia, especially the integration between the values of science and religion. This study aimed to develop pictures of media based on Islamic values in Biology learning for high school students. The research and development procedures proposed by Borg & Gall and ADDIE model proposed by Kurt which had been modified into the ISI-ARE (Investigate, Strategy, Improve, Assessment, Realization, and Estimation) model was used as the research method. The data was collected through investigations and questionnaire validation by four experts (material, media, language, and religion). The investigation questionnaire and a media feasibility response questionnaire were distributed to two experienced biology teachers and 20 tenth-grade students (10 males and 10 females). The results showed that the media, religion, and language experts stated that the developed Islamic-based pictures media was highly feasible to be used with the obtained percentage of 90.30 %, 83.70 %, and 81.50 %. However, the material experts rated the media as feasible (75.00 %) and the teachers and students respectively rated the media as highly feasible with a percentage of 75.40 % and 87.20 %. This study illustrates that the Islamic values-based pictures media can be used as an alternative in biology learning.

INTRODUCTION

The development of science and technology in the era of globalization is developing rapidly (Hasbullah, 2018; L., Arnyana, & Adnyana, 2018). This phenomenon results in global competition (Mulyani, Asyhar, Yelianti, & Syarial, 2018; Sabaniah, Winarni, & Jumiarni, 2019; Suprapto, 2018). To face these challenges, an effective learning process and learning media as a facility to achieve learning objectives are needed (Bagus & Arjaya, 2018; Khasanah, 2018; Mardiani, Maasawet, & Hardoko, 2018). Besides the cognitive domain, one other component that must be improved is the spiritual attitude domain that will shape human resources, especially in science learning (Abbas & Bin Hassan, 2014; Kholifah, 2018; R. T. Sari & Jusar, 2017).

Science was born and developed through scientific methods such as observation and experimentation (Titik Rahayu, Syafril, & Wati, 2016). The integration of Islamic values is one of the characteristics in the study of science because science and religion are two closely related fields (Sudarisman, 2018).

Science is associated with empirical studies, while religion is associated with the science of revelation (Yusof, Rashid, Osman, & Iksan, 2016). The values of religion can be seen by examining the process of creation and the surrounding phenomena (Al-hadabi, 2016). The branch of science that studies knowledge about living things and nature is biology (Ningrum, Lestari, & Kusmiyati, 2018). So, biology material is very suitable to be associated with the power of God, with the Qur'an as the source of biology (Nusaibah, Mohd.Salehudin, & Iksan, 2018).

Biology has a very diverse nature of objects, such as metabolic processes, ecosystems, biodiversity, and the environment (Susanti, Asyhari, & Firdaos, 2019). However, some of the material is considered difficult by students because the learning process is still abstract (Abdurrahman, 2017). Meanwhile, the problem that occurs in current learning practices is that students have not been able to capture and make accurate conclusions (Aini et al., 2019).

Also, the instructional media used by teachers are still in the form of PowerPoint, videos, and printed books (Mualimin & Subali, 2018). Since the teachers are facilitators who play a role in realizing learning objectives in schools, they should anticipate these problems (T Rahayu et al., 2019). The response was then initiated by Pahrudin et al., that in the meantime, the performance of science teachers needs to be improved through an appropriate learning approach (Pahrudin, Irwandani, Triyana, Oktarisa, & Anwar, 2019). This condition refers to the teacher's role as an educator, which is demanded to be innovative and creative in the learning process (Syafrimen, Mohd.Ishak, & Erlina, 2017).

Another effort is the use of appropriate learning media. One of the learning media that can be applied is picture media (Mufid, 2014). Picture media are visual media in the form of pictures, lines, words, and symbols. The picture media has aimed to attract attention, clarify the material, illustrate facts and information, improve the quality of learning, arouse students' ideas and imagination, and optimize the ability of students to be more productive (Sakti, 2018). Furthermore, the picture media is even better if integrated with Islamic values. This is done to foster students' awareness of the intellectual, emotional, and spiritual aspects (Purwati, Zubaidah, Corebima, & Mahanal, 2018). Through such a process of learning biology, students can be active and interested in learning (P. S. Dewi, 2016). Thus, the provision of suitable media is a form of empathy of a teacher towards the learning process that they do (Titik Rahayu, Syafrimen, Widya, Weke, & Osman, 2018).

Research on picture media with different methods and materials has been done by previous researchers, including; media picture series (L. P. E. Sari, Ardana, & Putra, 2016), picture media on physics material (Hanna, Sutarto, & Harijanto, 2016), social science material (N. N. A. I. Dewi, Omegantini, & Dian, 2017), Indonesian language material (Akbar & Tarman, 2018), media for writing poetry (Yanti, Gafar, & Rofii, 2018), and media for understanding sex education (Damayanti, Anni, & Mugiarso, 2018).

This research is based on Hmelo-Silver, which states that one of the keys to students' success in adapting to their environment is through the integration of technology and educational development, especially in the field of science (Gardner, 2006; Hmelo-Silver, 2013). The development in question is the existence of innovation and creativity in learning biology (Moeed & Anderson, 2018). It is relevant to the opinion of Harlen (2007) that the nature and characteristics of learning biology are the use of instructional media (Harlen, 2007). This is relevant to the statement of Gibson

(2017), developing science in an adaptive competence required conformity to current conditions (Gibson, 2017).

The application of picture media in biology learning itself has also been made (Akmalia, Idris, & Zahara, 2018; Amalia, 2016; Ferazona, Elfis, & Hajar, 2015; Handayani, Napitupulu, & Hadap, 2016). However, none of these studies have integrated picture media with Islamic values. Meanwhile learning natural knowledge (science) will be easier if it is carried out through the integration of Islamic values (Mulyani et al., 2018), especially in Islamic schools. Picture media can be seen as a form of teacher's implementation attitude in developing learning media (Yusnita et al., 2018). For this reason, this study aimed to develop a model and assessed the feasibility of pictures media based on Islamic values in Biology learning.

METHOD

This research was carried out using Research and Development by Borg & Gall and the ADDIE model by Kurt, which have been modified into the ISI-ARE model. The following is a description of the stages of the ISI-ARE model.

Figure 1. Stages of ISI-ARE Model, the image is modified from Borg & Gall, and Kurt (ADDIE Model)

ISI-ARE model has a systematical stage according to conditions. Researchers sparked the idea based on modifications from Borg & Gall and Kurt's research (ADDIE Model) (Gall, P., & Borg, 2015). ISI-ARE model packages the design stages to be more concise. The steps include (1) **Investigate**, at this stage, the researchers collect information, perform analysis, and conduct a pre-survey test, (2) **Strategy**, at this stage, the researchers are planning the design of the concept that will be carried out after the pre-survey in the field. (3) **Improve**, the researchers develop products/media that will be applied in the research, (4) **Assessment**, at this stage, the developed media is given an evaluation by experts, (5) **Realization**, at this stage, the researchers conducted a field trial, (6) **Estimation**, this is the final stage of the final product development and evaluation of research results.

Overall, the stages carried out by Borg & Gall (10 stages) and Kurt (ADDIE Model) 5 stages, have been summarized and carried out by the ISI-ARE model into 6 stages. Furthermore, data collection techniques were carried out through an inquiry and validation questionnaire to four experts (material, media, language, and religion), an investigation questionnaire, and media feasibility responses to two experienced biology teachers and 20 students (10 males and 10 females) of the tenth grade.

RESULT AND DISCUSSION

The ISI-ARE model consists of six steps, namely: (1) Investigative, (2) Strategy, (3) Improve, (4) Assessment, (5) Realization, and (6) Estimation. In the **Investigative** stage, the researchers investigated the problems and needs of students in learning biology. At this stage, researchers look for any material opportunities that can be described and can be associated with Islamic values. The investigation process was also carried out through discussions and consultations with biology teachers.

At the **Strategy** stage, researchers began to formulate any images that could be made, related Qur'anic verses, and choose drawing tools or software that could be used to create media of images. The process of making the pictures is done with two applications, namely *SAI Paint Tool* which is an application to draw and edit pictures and *Corel Draw* which is an application to edit portions of the verses of the Qur'an inserted in the lower right corner of the picture.

At the **Improve** stage, the researchers develop media that will be applied in the research of the researchers. The pictures created are media that contain Islamic values for learning biology.

Figure 2. Islamic Value-based Picture in Biology Learning

At the **Assessment** stage, media products are evaluated by experts consisting of material experts, linguists, media experts, and religious experts. Based on the data sources collected, the following assessment results were found: (1) material experts = 75.00 %, (2) linguists = 81.50 %, (3) media experts 90.30 %, (4) religious experts = 83.70 %.

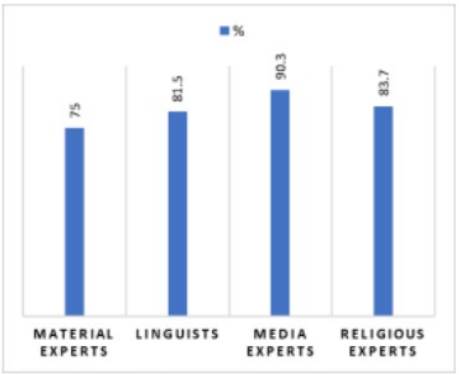

Figure 3. Media Assessment Results

The next stage was the **Realization** stage. At this stage, a field trial is conducted on the teacher and students. Two experienced teachers and 20 students were asked to rate the developed media products. The results can be presented in Figure 4.

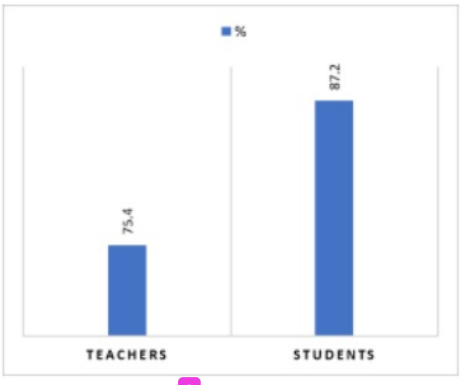

Figure 4. Teachers and Students Responses

Based on the results of the media assessment in Figure 3 and Figure 4, the developed media is appropriate to be used in the biology learning process. The results of this study are consistent with (Fox, 2017) opinion that biology needs to be integrated with the right innovation. Furthermore, (Amri, 2017) asserts that the integration of Islamic values in biology learning, such as the Kauniyah verses of the Qur'an as an outline of the material, can deepen and strengthen the students' understanding.

The last stage was **Estimate**. At this final stage, the product image of the development results is checked again to be repaired and completed if there are deficiencies. If deemed sufficient, then this product image is ready to be applied in biology learning.

According to (Lestariningsih, Mulyono, & Ayatusa'adah, 2018), competencies that are considered in learning biology are mastery of the basic spiritual concepts and their integration in building character as Muslim scientists and in building understanding related to the concept of biology based on the Qur'an. This way, this research produced a systematic concept by applying the Islamic-based picture media, as described in Figure 2.

Genetic and species diversity, as shown in Figure 2, is the diversity that occurs in living things. It can be indicated by variations in one species or type. Based on these pictures, it appears that the colors, pictures, and writing of the media are very interesting so that it motivates students to learn. The picture gives a signal that integrating biological concepts with Islamic values is necessary. The material is linked to surah Al-Jaatsiyah verse 4 that describes that the diversity of living creatures is determined by the arrangement of sets of genes, the interaction between genes, and the environment. Surah Az-Zumar verse 21 reflects the greatness and power of God. Allah created creatures that move and animate and livestock of various colors and types. Thus, we are ordered to always submit to God and take lessons (Aziz, Nursobah, Mahmud, & Mansyur, 2019).

Species diversity is a variation of species of plants, animals, and organisms that live in an ecosystem or certain places. The pictures are direct examples of biodiversity material. In the picture, verses of the Qur'an relating to the material had been inserted. As shown in Figure 2, surah Al-Faathir verse 28, tells about the diversity of species of animals which is related to species diversity.

Based on this explanation, it can be concluded that the picture media is very feasible to use. This is where the connected model occurs between biology material through the picture media and Islamic values that are packaged by incorporating verses of the Qur'an. This shows that the concept of media development is very useful for learning.

The values contained in the Qur'an can be developed through science learning (Diani & Hartati, 2018; Sada, 2016). As such, science studies are one form of *kauniyah* verses so to form a unity for teaching, it must be coupled with adding the basics of the Qur'an. Also, (Latifah, 2015) argues that Islamic value-based picture media provide new experiences. The pictures presented and the writing of verses of the Qur'an are in accordance with the contents of the material, easy, very practical, and also foster curiosity (Yusnita et al., 2018).

Picture media also used function to facilitate communication that is difficult for students to imagine the concept or material. Also, through the picture media that contains verses of the Qur'an, it is very easy for teachers to improve the students' religious characters (Nurjanah, Retno Triwoelandari, & Nawawi, 2018).

Furthermore, there are several benefits of the developed picture media, namely: (1) it is flexible and can be used

anytime and anywhere because this media is made as efficient as possible in the form of posters, (2) it is concrete because the picture media shows more realistic material compared to verbal media, (3) It is simple since pictures can overcome the limitations of space and time since not all objects or events can be brought to class and students cannot always be taken to the tourist attraction/event, (4) Lastly, it is economical, inexpensive, and easy to obtain and use without requiring special equipment.

Based on the discussion above, science and Islamic values cannot be separated. Therefore, knowledge is the core while science is the branch. Science has an organic relationship with its core, namely, knowledge. In Islam, that relationship is maintained. Biology learning requires a picture of media development that can be integrated with Islamic values.

CONCLUSION

The results of the study show that the development model of picture media based on Islamic values is one form of the connected model. This indicates that learning that combines Islamic values and biological concepts is very suitable as one of the media to improve religious character so that it becomes a coherent whole. Also, the process of learning biology becomes more meaningful, interesting, and fun. On this basis, various facts and phenomena that exist in nature (*kauniyah* verses) can only be understood by people who believe by using knowledge and technology. So that biology material becomes full of comprehensive values.

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728

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